

IN THE CLAIMS:

Please amend the claims as follows:

Claims 1-6. (Cancelled)

7. (Original) An angular velocity sensor comprising:

a sensor element including a driver part and a detector part for detecting an angular velocity;

a driver circuit for supplying a driving signal to the driver part of said sensor element, wherein a monitor signal is output from said sensor element and coupled to said driver circuit;

a detection unit including a charging amplifier and a synchronous detector, wherein an output from the detector part of said sensor element is applied to said charging amplifier, and wherein said synchronous detector receives both a signal synchronized with said driving signal and an output of said charging amplifier, said detection unit outputting an angular velocity signal; and

a self diagnosis unit for detecting an abnormality of said sensor element and outputting a self diagnosis signal by coupling said signal synchronized with said driving signal to an input of said synchronous detector,

wherein said self diagnosis unit comprises:

an attenuator for attenuating the signal synchronized with said driving signal and

a capacitor injecting the signal synchronized with said driving signal from said attenuator to a circuit, said circuit having an output coupled to said synchronous detector.

Claims 8-42. (Cancelled)

43. (New) An angular velocity sensor comprising:

a sensor element including a vibrator and a detector for detecting an angular velocity;  
a drive unit including a driver circuit and a monitor circuit, wherein said driver circuit supplies a driving signal to the vibrator of said sensor element, and said monitor circuit receives a monitor signal from said sensor element;

a detection unit including a pair of current amplifiers, a differential amplifier, a phase shifter and a synchronous detector, wherein said pair of current amplifiers receive outputs from the detector of said sensor element, said differential amplifier amplifies the difference of outputs from said pair of current amplifier, said phase shifter shifts the phase of an output of said differential amplifier by 90 degrees, and said synchronous detector detects an output from said phase shifter in synchronous with the monitor signal of said drive unit and outputs an angular velocity signal; and

a self diagnosis unit for outputting a diagnosis signal to detect an abnormality of at least one of said sensor element, said detection unit and said drive unit, by providing a displacement signal synchronized with said monitor signal to said detection unit.

44. (New)     A angular velocity sensor according to claim 43, wherein said self diagnosis unit comprises an attenuator for attenuating said signal synchronized with said monitor signal to generate said displacement signal, and an injector for providing said displacement signal from said attenuator to said detection unit.

45. (New)     An angular velocity sensor according to claim 43, further including a changing unit for changing said self diagnosis unit to either a working state or a non-working state, said changing unit being disposed between said attenuator and said injector.

46. (New)     An angular velocity sensor according to claim 45, further including a judge

unit for continuously judging an abnormality of one of said sensor element, said detection unit and said drive unit, by detecting an output level of said detection unit during the non-working state of said self diagnosis unit.

47. (New) An angular velocity according to claim 45, wherein said changing unit is a switch for connecting or disconnecting, in accordance with an external control mechanism, said displacement signal to said injector.

48. (New) An angular velocity sensor according to claim 45, wherein said changing circuit unit comprises a timer circuit for connecting or disconnecting for a given time, in accordance with an external control mechanism, said displacement to said injector.

49. (New) An angular velocity sensor according to claim 44, wherein said injector comprises a capacitor.

50. (New) An angular velocity sensor according to claim 44, wherein said injector comprises a resistor.

51. (New) An angular velocity sensor according to claim 44, wherein said attenuator includes a ladder network resistor capable of digitally adjusting at least one of an amplitude and phase of an input signal.

52. (New) An angular velocity sensor according to claim 44, further including a balancing unit, wherein said balancing unit is disposed at an input terminal of one of said pair of current amplifiers and said input terminal is not connected to said injector, whereby said balancing unit maintains a balance of input characteristics between each of said pair of current amplifiers.